

**UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION**

VERVE, L.L.C,

Plaintiff,

v.

Case No. 99-CV-76096 DT

CRANE CAMS, INC., CROWER CAMS
EQUIPMENT CO., TREND PRODUCTS,
INC., and COMPETITION CAMS, INC.

Honorable Arthur J. Tarnow
United States District Judge

Defendants.

**OPINION AND ORDER DENYING DEFENDANTS' MOTIONS FOR SUMMARY
JUDGMENT OF INVALIDITY AND GRANTING IN PART DEFENDANTS' MOTIONS
FOR SUMMARY JUDGMENT OF NON-INFRINGEMENT**

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I. INTRODUCTION

This patent infringement case involves the manufacture and sale of one-piece push rods for automotive internal combustion engines. Plaintiff Verve, L.L.C. does not manufacture push rods, but owns the rights in United States Patent No. 4,850,315 (the '315 patent), for a specific type of one-piece push rods. Plaintiff purchased the rights in the '315 patent from Mall Tooling and Engineering, which purchased the rights from the inventor.

Plaintiff alleges that Defendants manufacture and sell one-piece push rods in violation of the '315 patent.¹

At issue are Defendants' motions for summary judgment, which argue that the '315 patent is invalid for obviousness and indefiniteness. In the alternative, Defendants argue that they are entitled to summary judgment because their one-piece push rods do not infringe the '315 patent. For the following reasons, Defendants' motions for summary judgment of invalidity will be DENIED, and their motions for summary judgment of non-infringement will be GRANTED IN PART.

¹Defendant Trend manufactures one-piece push rods. Defendant Crower does not manufacture one-piece push rods, but sells one-piece push rods purchased from Trend and other manufacturers who are not parties to this lawsuit. Defendant Competition Cams, Inc. sells one-piece push rods that it purchases from Trend. Crane Cams, Inc. is no longer a party-defendant.

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II. BACKGROUND

Claims 1 and 13 of the '315 patent are in dispute in this litigation. Claim 1 states:

A push rod for an internal combustion engine comprising: a single piece of metal in the form of an elongated hollow tube having a middle portion, first and second end portions and rounded seats at the tips thereof, said middle portion having a larger outer diameter than the end portions, and said tube having a substantially constant wall thickness throughout the length and the tips thereon.

United States Patent No. 4,850,315.

Claim 13 sets forth a process for manufacturing the push rod described in Claim 1. Claim 13 states:

A method of making a one-piece push rod, said method comprising: (a) providing a hollow tube having a given outer diameter; (b) compressing at least the end portions of the tube provided in step (a) said tube having a substantially constant wall thickness throughout the length of the tube and the tips thereon; and (c) forming tips of the tube into the desired shape.

Id.

On May 16, 2001, the Court granted Defendants' first motion for summary judgment on grounds of vagueness and anticipation. *Verve LLC v. Crane Cams*, 145 F.Supp. 2d 862 (E.D. Mich. 2001). As to vagueness, the Court held that the meaning of the phrase "substantially constant wall thickness" was so unclear as to render the claim indefinite based on the lack of a definition of "substantially" in the intrinsic record, that is, the prosecution history of the '315 patent.

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As to anticipation, the Court held that the ‘315 patent was invalid due to lack of novelty under 35 U.S.C. § 102(b) because two Japanese patents, JP 635 and JP 808, teach every element of the ‘315 patent.

The Federal Circuit reversed this Court’s decision. *See Verve, LLC v. Crane Cams, Incorporated*, 311 F.3d 1116 (Fed. Cir. 2002). First, the Court reversed as to vagueness and remanded the case

for further proceedings, including any appropriate recourse to extrinsic evidence concerning the usage and understanding of the term “substantially” in relevant context.

Verve, 311 F.3d at 1120.

Second, the Court reversed as to anticipation, holding as follows:

[Plaintiff] stresses that the Japanese push rods [JP 635 and JP 808] are not wider at their mid-portion like the ‘315 rods, but are of uniform diameter along their length. The drawings in the Japanese patents and the ‘315 patent reflect this distinguishing difference. Although the defendants argue that the ball shape at the end of the Japanese rods is of narrower diameter than the rest of the rod and thus that the Japanese end portion is narrower than the middle portion, **the invention as described and claimed in the ‘315 patent does not encompass a tube of uniform diameter along its length, whatever the diameter at the rounded tip.**

The Japanese patents on their face do not show the push rods of the ‘315 patent. No question of material fact is present, for neither the structures, nor their differences, is disputed. On the undisputed facts, no reasonable trier of fact could find the ‘315 invention anticipated by these Japanese references. Summary judgment of invalidity on the ground of anticipation is reversed.

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311 F.3d at 1121 (emphasis added).²

On remand, the parties engaged in further discovery concerning the scope and meaning of the ‘315 patent as well as whether or not the push rods manufactured and sold by Defendants infringed the ‘315 patent. The parties were directed to conduct discovery with a focus on the volume of push-rods sold by Defendants that meet the definition applied by the Federal Circuit. This task was complicated by the parties’ continuing dispute as to the scope and meaning of the ‘315 patent.

The Court heard oral argument on Defendant’s motion for summary judgment on non-infringement and obviousness on March 10, 2004. The hearing was continued on March 23, 2004. The March 23, 2004 hearing also served as a hearing to determine claim construction as required by *Markman v. Westview Instruments*, 517 U.S. 370 (1996).

On March 26, 2004, the Court issued an order denying Defendant’s motion for summary judgment of invalidity without prejudice and granting Defendant’s motion for summary judgment of non-infringement as to the rod identified in discovery as “Trend 3” on the ground that its wall thickness was undisputably not “substantially constant.”

²Presumably, because the Japanese push rods are not of uniform diameter across their *entire length*, the Federal Circuit used the term “length” to describe the portion of the push rod identified as the “middle portion” in this Court’s claim construction and definitions.

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The Court's March 26, 2004 order also established the following claim construction for claim 1 of the '315 patent:

'315 Patent: Claim 1 Construction

Definitions

middle portion: a lengthwise section or point of the rod located between the end portions, excluding any lengthwise section that narrows before connecting to an end portion.

end portion: a lengthwise section of the rod that includes, exclusively:

- 1) the tip and rounded seat; *and*,
- 2) if present, any short narrowing section leading to the tip whose narrowing is geometrically necessary so that the tip may be connected to the section adjoining the tip as located toward the middle portion; *and*,
- 3) if present, any section of constant diameter which:
 - a) connects to either (1) or (2) immediately above, *and also*,
 - b) is smaller in diameter than the middle portion.

tip: the part of the end portion with rounded seats intended to make contact with another device

rounded seat: a rounded section at the tip intended to make contact with another device

substantially constant wall thickness: a difference in wall thickness between the thinnest and thickest widths of the rod's walls such that the thickest width is not more than 20% wider than the

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thinnest width

Further Claim Limitation

A rod does *not* infringe Claim 1 although it technically meets the definition if it has a constant diameter in the space between the rod's two end portions.

Order of March 26, 2004, pp. 2-3.

At the conclusion of the *Markman* hearing, the parties were instructed to engage in further discovery in light of the Court's claim construction.

On May 27, 2004, Defendants filed their renewed motion for summary judgment of invalidity and non-infringement.

On November 9, 2004, the Court heard oral argument on Defendants' renewed motion for summary judgment. Oral argument continued on March 8, 2005.

III. STANDARD OF REVIEW

Summary judgment is appropriate when there is no genuine issue as to any material fact and the moving party is entitled to a judgment as a matter of law. Fed. R. Civ. P. 56(c). In this case, Defendants bear the initial responsibility of demonstrating that there is an absence of a genuine issue of material fact. *Celotex Corp. v. Catrett*, 477 U.S. 317, 323; 106 S.Ct. 2548; 91 L.Ed. 2d 265 (1986). Material facts are determined by the substantive law in the case. *Anderson v. Liberty Lobby*, 477 U.S. 242, 247 (1986). All inferences must be made in a light

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most favorable to the non-moving party, in this case Plaintiff Verve. *Matsushita Electric Industrial Co. v. Zenith Radio Corp.*, 475 U.S. 574, 586 (1986).

A patent is presumed valid. To overturn a patent, the challenger must clearly prove those facts which support patent invalidity. While the ultimate question of patent validity is a question of law, the conclusion that an invention is valid depends on several factual inquiries. Therefore, a district court can properly grant, as a matter of law, a motion for summary judgment on patent invalidity when the factual inquiries present no genuine issue of material facts. *See Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 715-16 (Fed. Cir. 1991).

IV. DISCUSSION

Patent infringement analysis involves two steps. First, the court determines the scope and meaning of the patent claims asserted, and then the properly construed claims are compared to the allegedly infringing device by the trier of fact. *Cybor Corp. v. FAS Technologies, Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998) (internal citation omitted). The first step, claim construction, is purely a matter of law to be decided by the judge. *Id*; see also *Phillips Petroleum Co. v. Huntsman Polymers Corp.*, 157 F.3d 866, 870 (Fed. Cir. 1998).

A. Claim Construction

As noted above, the current claim construction in this case defines “substantially constant wall thickness” as:

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a difference in wall thickness between the thinnest and thickest widths of the rod's walls such that the thickest width is not more than 20% wider than the thinnest width

Order of March 26, 2004, p. 3.

Plaintiff argues that the Court should amend its claim construction to avoid ascribing any numerical value, whether 20% or otherwise, to the phrase “substantially constant wall thickness.” Plaintiff argues that the Court’s application of a numerical value to determine variation in wall thickness is improper under Federal Circuit case law. The Court agrees.

In reversing this Court’s prior summary judgment ruling in this case, the Federal Circuit stated as follows:

Expressions such as “substantially” are used in patent documents when warranted by the nature of the invention, in order to accommodate the minor variations that may be appropriate to secure the invention. Such usage may well satisfy the charge “to particularly point out and distinctly claim” the invention, 35 U.S.C. § 112, and indeed may be necessary in order to provide the inventor with the benefit of his invention...[U]sages such as “substantially equal” and “closely approximate” may serve to describe the invention with precision appropriate to the technology and without intruding on the prior art... “[L]ike the term ‘about,’ the term ‘substantially’ is a descriptive term commonly used in patent claims to ‘avoid a strict numerical boundary to the specified parameter[.]’”

311 F.3d at 1120 (internal citations omitted).

In *Cordis Corporation v. Medtronic AVE, Incorporated*, 339 F.3d 1352 (Fed. Cir. 2003), the Court held that the proper interpretation of the term

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“substantially uniform thickness” was “of largely or approximately uniform thickness” unless something in the prosecution history imposed the “clear and unmistakable disclaimer” needed for narrowing beyond this plain-language limitation. 339 F.3d at 1361; *See also Playtex Products, Incorporated v. Procter & Gamble Company*, ---F.3d ---, 2005 WL 517914 (Fed. Cir. Mar. 7, 2005) (citing *Cordis* and holding that a patent which claimed in part a portion of a tampon applicator having “two diametrically opposed, substantially flattened surfaces” was not indefinite and the district court improperly ascribed a numerical value to the term).

1. Judicial Estoppel

According to Defendants, the Court’s current claim construction should remain in effect because Plaintiff argued in the Federal Circuit that a deviation in wall thickness of more than 20% between the thinnest and thickest portion of a push rod would remove such a push rod from the scope of the ‘315 patent. Defendants argue that Plaintiff should now be barred by judicial estoppel from arguing against the “thinnest-to-thickest” measurement methodology for wall thickness in this case.

In *New Hampshire v. Maine*, 532 U.S. 742 (2001), the Supreme Court described the doctrine of judicial estoppel as follows:

Courts have observed that the circumstances under which judicial estoppel may appropriately be invoked are probably not reducible to any general formulation of principle[.] Nevertheless, several factors

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typically inform the decision whether to apply the doctrine in a particular case: First, a party's later position must be "clearly inconsistent" with its earlier position. Second, courts regularly inquire whether the party has succeeded in persuading a court to accept that party's earlier position, so that judicial acceptance of an inconsistent position in a later proceeding would create the perception that either the first or second court was misled[.] Absent success in a prior proceeding, a party's later inconsistent position introduces no risk of inconsistent court determinations, and thus poses little threat to judicial integrity. A third consideration is whether the party seeking to assert an inconsistent position would derive an unfair advantage or impose an unfair detriment on the opposing party if not estopped.

532 U.S. at 749-51; *see also Data General Corp. v. Johnson*, 78 F.3d 1556, 1565 (Fed. Cir. 1996).

In this case, Plaintiff argued to the Federal Circuit that the term "substantially constant" would be understood by one of skill in the art to require wall thickness that is constant to a large or considerable extent. Elsewhere in its appellate brief, in the context of distinguishing the '315 patent from the Japanese patents JP '635 and JP '808, Plaintiff stated it "would certainly agree that a deviation of 20% or more is not a reasonable deviation and thus is not to a large degree or substantially constant." Plaintiff's App. Br. at 39.

Judicial estoppel is an equitable doctrine to be applied by the Court at its discretion. *New Hampshire v. Maine*, *supra* at 750. Based on the standard for judicial estoppel set forth in *New Hampshire v. Maine*, the Court rejects Defendants' judicial estoppel argument.

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First, Plaintiff's argument to the Federal Circuit did not state which measurement methodology would be used to measure wall thickness for the purpose of reaching this conclusion. Nor did Plaintiff deviate from its overall position that the ultimate inquiry should be whether or not wall thickness is to a large degree constant. Therefore, the Court cannot conclude that Plaintiff's current position is clearly inconsistent with its prior position for judicial estoppel purposes.

Second, Plaintiff did not succeed in its position concerning wall thickness on appeal. The Federal Circuit did not even reach the question of where the line between substantial and non-substantial wall thickness would be drawn, much less rely on Plaintiff's representation.

Third, Plaintiff's statement on appeal has not created an unfair advantage or detriment. Plaintiff has consistently maintained that the Court should not ascribe a numerical value to the phrase "substantially constant." Therefore, judicial estoppel does not apply.

Having determined that the current claim construction is flawed and Defendants' judicial estoppel argument is without merit, the Court must decide whether or not there is a "clear and unmistakable disclaimer" which would justify a departure from the ordinary meaning of the term "substantially."

2. The Definition of "Substantially Constant Wall Thickness"

As the Federal Circuit's opinion in this case indicated, the phrase

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“substantially constant wall thickness” must be construed according to “how the phrase would be understood by persons experienced in this field of mechanics, upon reading the patent documents.” *Verve*, 311 F.3d at 1120. In this case, the parties have presented testimony from two expert witnesses as to the meaning of the phrase “substantially constant wall thickness.”

Plaintiff’s expert witness, Dr. David Bourell, testified by declaration as follows:

Claim 1 also requires that the tube have a “substantially constant wall thickness” throughout its length and the tips thereon. This term also has its ordinary meaning. I understand the term substantially to mean to a large or considerable degree. Thus, wall thickness throughout the length of the tube must be largely or considerably constant. Based on my review of the push rods, and based on my understanding in engineering principals (sic), the starting stock from which push rods are formed has relatively large tolerances or large variations in the wall thickness prior to any processing. Thus, at a minimum, if the wall thickness of the tube after formation is still within the accepted industry tolerances for the tube prior to formation, then the wall thickness can be considered substantially constant.

Bourell Declaration, § 9.

Defendant’s expert, Dr. Lee Swanger, testified at the *Markman* hearing on March 23, 2004 as to his understanding of the term “substantially constant wall thickness,” stating that the term

is as the Court has held in its claim construction. That it is a measure between the thickest and thinnest part of the wall of the push rod. And up until I saw a piece of paper with a blank in it, that difference

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had been 20 percent.

Markman Hearing Tran., 3/23/04, 37.

Dr. Swanger also testified as to other bases for his definition of the term “substantially constant wall thickness.” First, Dr. Swanger stated he arrived at the 20 percent figure by relying on Plaintiff’s statement on appeal in the Federal Circuit. *Markman* Hearing Tran., 3/23/04, 45. Second, Dr. Swanger testified that a General Motors push rod design from the 1960’s, when analyzed according to the Court’s current claim construction, would result in “a backing up of the 20 percent as being an extreme example of the kind of variation that one familiar with push rods would call substantially uniform.” *Markman* Hearing Tran., 3/23/04, 45-6.

Dr. Swanger’s reference to the General Motors blueprint provides some context for how persons in the field might interpret the claim term. However, the basis for his reading of the GM blueprint is this Court’s claim construction and Plaintiff’s statement on appeal, which are not probative of the term’s meaning to persons of ordinary skill in the art. Therefore, Dr. Swanger’s testimony is not helpful to the Court in performing the task at hand, which is to determine “how the phrase would be understood by persons experienced in this field of mechanics, upon reading the patent documents.” *See Verve*, 311 F.3d at 1120.

Dr. Swanger also testified that “for some reasons” he would agree with Dr. Bourell’s definition of “substantially constant wall thickness.” *Markman* Hearing Tran., 3/23/04, 47.

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Most importantly, Dr. Swanger testified that the “thickest-to-to thinnest” methodology is not specified anywhere in the ‘315 patent, that this methodology is not specified anywhere in the prosecution history of the ‘315 patent, that the ‘315 patent does not set forth any percentages for what would constitute “substantially constant wall thickness,” and that the prosecution history for the ‘315 patent does not set forth any percentages for what would constitute “substantially constant wall thickness.” *Markman* Hearing Tran., 3/23/04, 37-8.

While Dr. Swanger’s testimony supports Defendants’ contention that the ‘315 patent is indefinite, it also supports Plaintiff’s argument that the ‘315 patent does not require a particular measurement methodology for ascertaining wall thickness variation. Therefore, the Court finds that persons experienced in the field would not decide upon a numerical construction of the phrase “substantially constant wall thickness” upon reading that phrase in the patent documents.

Applying the law of the Federal Circuit as stated in *Cordis, supra* and *Playtex, supra*, the Court concludes that its current claim construction is improper because it impermissibly introduces a numerical value to the definition of “substantially constant wall thickness.” The Court is persuaded by Dr. Swanger’s testimony at the *Markman* hearing that neither the terms of the patent, nor its prosecution history, specify a method or percentage for gauging wall thickness variation. Therefore, the prosecution history of the ‘315 patent cannot be said to include the type of “clear and unmistakable disclaimer” necessary to abandon the

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limitation imposed by the plain language of the claim. *See Cordis*, 339 F.3d at 1361.

Based on the foregoing, the Court hereby amends its claim construction to state that the term “substantially constant wall thickness” shall be construed as “wall thickness that is to a large or considerable degree constant.” In future proceedings before the Court, the parties may present evidence as to competing methodologies for measuring wall thickness variation. However, the Court finds that the question of which methodology should be used is a fact question for the jury. The Court will not settle upon one particular method for measuring wall thickness as a matter of claim construction because such a decision is not required by the claim language.

B. Invalidity

Issued patents have a strong presumption of validity in infringement proceedings. 35 U.S.C. § 282 (1994). Hence, accused infringers such as Defendants, who defend on grounds of patent invalidity, bear the burden of showing patent invalidity by clear and convincing evidence. *Id*; *Monarch Knitting Mach. v. Sulzer Morat GMBH*, 139 F.3d 877, 881 (Fed.Cir.1998). “Clear and convincing evidence exists when the movant ‘place[s] in the mind of the ultimate fact finder an abiding conviction that the truth of its factual contentions are ‘highly probable.’” *Teleflex v. KSR Intern. Co.*, 119 Fed. Appx. 282, 285 (Fed. Cir. 2003) (unpublished) (internal citation omitted).

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1. Obviousness

“A patent is invalid if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 716 (Fed. Cir. 1991) (citing 35 U.S.C. § 103)).

Although the determination of obviousness is ultimately a legal conclusion, it rests on underlying factual determinations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). These factual elements are: (1) the scope and content of the prior art; (2) the difference between the prior art and the claims at issue; (3) the level of ordinary skill in the pertinent art; and (4) objective or secondary considerations, such as whether there was a long-felt but unresolved need for the claimed invention, the failure of others, or whether the invention has enjoyed commercial success. *Id.*

The party alleging obviousness must show prior art references which alone or combined with other references would have rendered the invention obvious to one of ordinary skill in the art at the time of invention. *See Dennison Mfg. Co. v. Panduit Corp.*, 475 U.S. 809, 810 (1986); *Rockwell Int'l Corp. v. United States*, 147 F.3d 1358, 1364 (Fed.Cir.1998).

In *Teleflex, supra*, the Court held that

[w]hen obviousness is based on the teachings of multiple prior art

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references, the movant must also establish some ‘suggestion, teaching, or motivation’ that would have led a person of ordinary skill in the art to combined the relevant prior art teachings in the manner claimed.

Teleflex, supra at 285 (internal citations omitted).

“The nonmovant may rebut a *prima facie* showing of obviousness with evidence refuting the movant’s case or with other objective evidence of nonobviousness.” *Id.*

a. *Graham* Factors

i. Scope and Content of the Prior Art

For obviousness purposes, “[t]he relevant art ‘is defined by the nature of the problem confronting the would-be inventor.’” *Ryko Mfg. Co.*, 950 F.2d at 716 (quoting *Orthopedic Equip. Co. v. United States*, 702 F.2d 1005, 1008 (Fed. Cir. 1983)).

The specification of the ‘315 patent describes the purpose of the invention as follows:

The push rod 10" is relatively light weight, as compared with solid rods and thereby increases the efficiency of the engine. It is also expected to achieve better bending resistance and strength than conventional hollow push rods. Although it is not completely understood why the increased strength should result, it is believed that it is due to its tapered shape and the higher density of metal provided to the walls of the rod especially at its ends. The ends of a push rod are particularly susceptible to failure since they receive the primary force which can be quite large, especially in high performance engines. The tapered surfaces and/or the increased surface area per unit length of the rod tend to counteract forces which cause bending in

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the rod. Such bending is to be avoided since it can effect the performance of the engine. The design of the present invention does not require any modification of the other engine components and, in fact, can be interchangeable with conventional rods. All of these advantages are obtained without requiring the use of inserts or other nonhomogenous parts that have been welded or otherwise secured to the prior art push rods. Such inserts are known to fall off and can cause severe damage to the engine.

‘315 Patent Specification.

Based on the patent specification, the Federal Circuit held that the problem faced by the inventor of the ‘315 patent “was a need for stronger and stiffer [hollow] rods that could be manufactured from a single piece of metal without the need for inserts or other supporting structure.” *Verve*, 311 F.3d at 1118.

Defendants cite the following references as prior art that enabled the invention contained in the ‘315 patent: JP ‘808, the JP ‘635 patent, a General Motors push rod blueprint from 1964, JP ‘707, JP ‘340, JP 137, U.S. Patent No. 3,272,190 (“the Di Matteo ‘190 patent”), and Figure 1 in U.S. Patent No. 3,698,060 (“the Helton ‘060 patent”), and a 1936 textbook reference (the “Timoschenko textbook”).

JP ‘808 and JP ‘635 The JP ‘808 and JP ‘635 patents describe a hollow tube one-piece push rods with uniform wall thickness and spherical (ball-shaped) ends. These references are within the scope of the ‘315 patent because they are part of the same field of endeavor as ‘315.

1964 GM Blueprint Defendants claim that certain three-piece push rods

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manufactured by General Motors in 1964 are hollow, have uniform wall thickness, and have a middle portion explicitly designed to be larger than the end portions. Because they are part of the same category of technology, the GM push rods are clearly within the scope of prior art relevant to the '315 patent.

JP '707, JP '340 and JP '137 JP '707, like the GM push rod design, discloses a three piece push rod which must fall within the scope of the prior art pertaining to push rods.

The JP '340 and JP '137 patents describe plungers meant for valve lash adjusters rather than push rods and are therefore not particularly helpful in an obviousness inquiry under § 103(a). The court finds that the '315 patent does not fall within the scope and content teachings of the JP '340 and JP '137 patents.

Di Matteo '190 Patent The relevant language in the Di Matteo '190 patent, which was issued in 1966, states as follows:

The push rod of the instant invention is a tubular configuration to maintain its weight at a minimum and is tapered throughout substantially its entire length in order to reduce any tendency of the push rod to bend under high stresses and during high engine speeds.

U.S. Patent No. 3,272,190.

Because the Di Matteo '190 patent describes a push rod for automotive engines, it falls within the scope of the prior art for obviousness purposes.

Figure 1 of the Helton '060 Patent Helton '060 describes a push rod guide rather than a push rod. However, Figure 1 of the '060 patent documents shows a

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push rod within the guide claimed by the patent. This reference is within the scope of relevant prior art for the '315 patent because the design for a push rod guide is reasonably pertinent to the concerns addressed by the '315 patent.

1936 Timoshenko Textbook Defendants argue that a 1936 textbook, Timoshenko's "Theory of Elastic Stability," (McGraw-Hill Book Co., Inc. 1936) instructs as a fundamental design principle that if one wishes to increase strength and stiffness of a column under compression (such as a push rod), one simply increases the diameter of its middle portion.

Timoshenko does not fall within the same field of endeavor as the '315 push rod. However, even though Timoshenko is not within the same field of endeavor as the '315 patent, it may still be combined with the other prior art references if it is reasonably pertinent to the problem the '315 patent attempts to solve. *See In re Clay*, 966 F.2d at 659. In *Clay*, the Federal Circuit described the reasonable pertinence analysis as follows:

A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem. Thus, the purpose of both the invention and the prior art are important in determining whether the reference is reasonably pertinent to the problem the invention attempts to solve. If a reference disclosure has the same purpose as the claimed invention, the reference relates to the same problem, and that fact supports use of that reference in an obviousness rejection. An inventor may well have been motivated to consider the reference when making his invention.

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If it is directed to a different purpose, the inventor would accordingly have had less motivation or occasion to consider it.

Id.

In this case, there are several differences between the purpose of the Timoshenko textbook and the '315 patent. First, Timoshenko is generally concerned with illustrating fundamental theories of elasticity, while the '315 patent is concerned with making a lighter, stronger push rod.

Second, Timoshenko's illustrations apparently show solid columns. The inventor of the '315 patent was concerned with hollow, rather than solid structures.

Third, Timoshenko teaches the riveting or welding of additional material to the middle portion of a column to increase strength. The purpose of the '315 patent sought to avoid this method because inserts or welded parts were known by the inventor to break off and cause engine damage.

Defendants claim that "Timoshenko is a fundamental text book well-known to college engineering students and structural design engineers." Brief In Support of Defendants' Motion for Summary Judgment of Invalidity at 7. Defendants also argue that "[a]s taught, in this rudimentary text, it is fundamental, routine knowledge that if one wishes to increase the strength and stiffness of a push rod, one simply increases the diameter of its middle portion, by taper or otherwise." *Id.*

Notably, Defendants have not produced any *evidence* for their claims as to

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the universality of Timoshenko and its accessibility to persons of ordinary skill in the art of push rods. There is no testimony in the record as to whether or not a person of *ordinary* skill in the art, seeking to produce lighter push rods with increased strength and stiffness, would have referred to Timoshenko for guidance in solving that problem.

The only evidence in the record concerning Timoshenko is the testimony of Plaintiff's expert, Dr. Bourell, who testified as follows:

My understanding of Timoshenko is that the way to maximize the load-carrying capability of a column while minimizing its weight is to reduce the diameter as one moves from the center of the rod to the ends. I--I think in general for a column to--to maximize the--the load-bearing capability of the strength of a column, we would make it as large a diameter everywhere. So I believe that Timoshenko is describing a method to--to equilibrate the--the strength of the rod while minimizing the weight of the rod.

Bourell Dep. at 28.

Dr. Bourell's explanation of the teachings of Timoshenko suggests that Timoshenko may be "reasonably pertinent" to the problems addressed by the '315 patent. The Court is somewhat persuaded by the fact that Dr. Bourell used the terms "column" and "rod" interchangeably in his description of Timoshenko, which suggests that its teachings may be applicable to the endeavor undertaken by the inventor of the '315 patent.

However, the Court cannot conclude that all factual questions concerning the applicability of the Timoshenko reference are resolved solely on the basis of Dr.

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Bourell's testimony because he did not explain whether or not a person of ordinary skill in the art would have been motivated to review Timoshenko in addressing the concerns of the '315 push rod.

In *In re Clay, supra*, the Court cited *In re Ellis*, 476 F.2d 1370, 1372 (CCPA 1973) for the premise that "the similarities and differences in structure and function of the invention disclosed in the references...carry far greater weight [in determining analogy]." *In re Clay, supra* at 660.

In this case, Defendants are not attempting to compare the '315 patent to a similar or analogous structure or invention, but rather are attempting to argue that a person of ordinary skill in the art of push rods would look to Timoshenko's 1936 textbook for guidance in addressing the problems addressed by the '315 patent. Because this inquiry calls for a great deal of specificity, the Court must take special care in holding Defendants to their burden of proof.

Given the evidence in the record, the Court is unable to conclude, as a matter of law, that a person having ordinary skill in the art would reasonably have expected to solve the problem of producing lighter push rods with increased strength and stiffness by considering Timoshenko, a textbook dealing with the strength of load-bearing columns and bars. *See In Re Clay, supra* at 660.

ii. Differences Between Prior Art and Claims At Issue

"When analyzing a patent claim for obviousness, the claim should be considered as a whole, but the differences between the claim and the prior art need

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to be identified to place the obviousness inquiry into proper perspective.” *Ryko Mfg. Co.*, 950 F.2d at 717.

As discussed above, claim 1 of Plaintiff’s ‘315 patent discloses a push rod for automobile engines while claim 13 of the ‘315 patent discloses a process for manufacturing the push rod described in claim 1.

JP ‘635 and JP ‘808 Defendants argue that the Japanese ‘635 and ‘808 patents show nearly the exact same push rod as the ‘315 patent, with the single difference being that the JP ‘635 and JP ‘808 are of a constant diameter along their middle portion.

The Federal Circuit concluded that *at least* one distinctive feature of the Japanese push rods (over the ‘315 patent) is the uniform diameter along the length, or middle portion, of the Japanese push rods.

Defendants argue that this is the *only* difference between the JP ‘808 patent and Plaintiff’s ‘315 patent. However, the Federal Circuit did not decide whether or not the JP ‘808 and JP ‘635 patents were also distinguishable based on the teaching of a hemispherical (ball shape) end portion. Indeed, the Federal Circuit did not have to analyze this distinction, because it held that “the ‘315 patent does not encompass a tube of uniform diameter along its length, whatever the diameter at the rounded tip.” *Verve*, 311 F.3d at 1121. Therefore, the Court finds it necessary to inquire further into the differences between the prior art, particularly the JP ‘808 and JP ‘635 patents, and the ‘315 patent claims at issue.

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As to the teachings of the JP '808 and JP '635 patents, Dr. Bourell's declaration states as follows:

13. It is my understanding that Defendants have argued that claims 1, 6, and 13 of the '315 patent are invalid in view of two Japanese references, namely JP 808 and JP 635. I have reviewed these references and they are concerned solely with the formation of a tip and make no mention of a reduced diameter end portion as a final feature on the pushrod. While various figures in both patents show a reduced end portion, this is only an intermediate processing step leading to the production of the final, spherical tip. Additionally, when the spherical tips are formed in the Japanese patents, it appears that the largest outer diameter of the tip is the same as the diameter of the middle portion of the rod.

Bourell Dec. at ¶ 13.

Dr. Bourell testified that the increase in wall thickness at the constriction of the JP '635 and JP '808 rods distinguishes them from the rod of the '315 patent and that this factor "teaches away" from the '315 claims. *Id.* at ¶ 14. However, the language of the '808 patent does not demonstrate this difference. In addressing the problems to be solved by the patented method, the '808 patent specification states as follows:

The constrictions are the members of which the greatest compressive strength is required. However, when the constrictions are formed by machining as set forth above, the wall thickness of the constriction is reduced and compressive strength decreases. The result is a problem in the form of poor durability. Although this problem can be solved by increasing wall thickness of the push rod at the constrictions, this is undesirable in that it increases the weight of the push rod.

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JP '808.

Based on the language of the JP '808 patent, the court finds that Dr. Bourell's declaration testimony that the JP '808 "teaches away" from the '315 patent based on wall thickness is not persuasive because the inventor of the JP '808 patent was clearly concerned with avoiding the weight problems associated with increasing wall thickness at the constriction of the push rod. Therefore, there is not a material difference between the Japanese patent and the '315 patent based on wall thickness.

However, the Court finds that there is an outstanding question of fact as to whether diameter is the *only* distinction between the JP '808 and JP '635 patents and the '315 patent.

As Dr. Bourell testified, the methods claimed by the JP '635 and JP '808 patents teach a reduced diameter end portion only as an intermediate processing step, whereas the '315 patent shows a final push rod with reduced diameter end portions. Thus, the Court finds that while the JP '635 and JP '808 patents are quite similar to the '315 patent, they are different from the patent at issue in at least two respects. First, the JP '635 and JP '808 patents teach a constant diameter across the middle portion of the push rod. Second, the JP '635 and JP '808 patents show a final push rod with hemispherical ends that may or may not be of the same outer diameter as the middle portion of the push rod.

1964 GM Blueprint The 1964 GM push rod design shows a three-piece

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push rod. This multiple-piece design materially distinguishes the GM push rod from the '315 patent. Defendants argue that this distinction is not material because the design demonstrates that the auto industry knew as early as the 1960s to widen the middle portions of push rods to increase strength and resist bending. However, Defendants have not submitted any evidence in support of this contention.

More importantly, it is improper to focus upon what is thought to be an invention's "most critical feature" while dismissing differences between the claims and the prior art as non-material distinctions. *See* JAMES GLADSTONE MILLS III, ROBERT C. HIGHLEY, & DONALD C. REILLY III, PATENT LAW BASICS, § 9.24 (2003) (citing *Litton Indus. Products, Inc. v. Solid State Systems Corp.*, 755 F.2d 158, 164 (Fed. Cir. 1985)).

The Court finds that the 1964 GM blueprint would not motivate the inventor of the '315 patent to employ a single piece design for a hollow push rod because the GM patent was concerned only with increasing strength and resisting bending, and was not concerned with the fracturing of the push rod based on multiple-part construction.

JP '707, JP '340 and JP '137 JP '707, like the GM push rod design, discloses a three piece push rod and is materially distinguishable from the '315 patent on that basis. The JP '340 and JP '137 patents describe plungers meant for valve lash adjusters rather than push rods and are therefore not particularly helpful in the Court's obviousness inquiry under § 103(a).

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The Di Matteo ‘190 Patent The ‘190 patent is distinguishable from Verve’s ‘315 patent because it requires a tapering of the wall thickness of the push rod as well as an insert tip. In addition, the ‘190 push rod only has one rounded end, and has one end portion (rather than two end portions) with a diameter that is smaller than the diameter of the middle portion.

Defendant argues that the ‘190 patent helps render the ‘315 patent invalid as obvious by disclosing the principle of using a wider mid portion to add strength. However, the Court is unwilling to dissociate this aspect of the ‘190 patent from its glaring differences for the purposes of comparison.

Figure 1 of the Helton ‘060 Patent The Helton ‘060 patent claims a push rod guide rather than a push rod. Figure 1 of the Helton ‘060 Patent shows a single piece push rod designed to be larger in the middle portion than at its ends. While Figure 1 of the ‘060 patent shows a prototype push rod within the claimed push rod guide, it does not describe any particular parameters for the push rod itself. Because the push rod shown in Figure 1 is only intended to occupy space in an illustration of the claimed push rod guide, and is not concerned with any particular design problems for push rods, such as bending resistance, the Court is unable to conclude that the content of the push rod illustrated in Figure 1 of the ‘060 patent is pertinent to the obviousness of the ‘315 design.

1936 Timoshenko Textbook As discussed above, the Timoshenko textbook is distinguishable from the invention claimed in the ‘315 patent.

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iii. Level of Ordinary Skill in the Art

A finding of the level of ordinary skill in the art provides the Court with a more objective lens through which to determine whether or not the patent at issue is invalid as obvious. Defendants bear the burden of coming forward with evidence regarding the level of *ordinary* skill in the art. *Lifting Technologies, Inc. v. Armstrong Steel Mfg., Inc.*, 19 U.S.P.Q.2d 1935, 1991 WL224272 (D. Minn. 1991) (not reported in F.Supp.).³ “In the obviousness analysis, the persons to focus on are those of ordinary skill, i.e., those in the ‘trenches,’ actually attempting to produce commercial products.” *Hybritech, Inc. v. Abbott Laboratories*, 4 U.S. P.Q.2d 1001, 1008-09, 1987 WL 123997 (C.D. Cal. 1987), affirmed, 849 F.2d 1446 (Fed. Cir. 1988).

In their original summary judgment brief, Defendants asserted that the level of ordinary skill in the art,

even at its lowest level, would be someone fully knowledgeable in routine structural design principles (such as taught by fundamental texts like Timoshenko). This level of skill, moreover, clearly and, indisputably, included in 1988 and well prior thereto, someone who,

³The following non-exclusive list of factors may be helpful in determining the level of ordinary skill in the art: (1) the types of problems encountered in the art; (2) the prior art solutions to those problems; (3) the rapidity with which innovations are made; (4) the sophistication of the technology involved; (5) the educational background of those actively working in the field; and (6) the educational background of the inventor. *AIR-vend, Inc. v. Thorne Industries, Inc.*, 625 F.Supp. 1123, 1135 (D. Minn. 1985), judgment aff’d, 831 F.2d 306 (Fed. Cir. 1987).

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at least, has a bachelor's degree in mechanical, automotive design, or structural engineering, or the equivalent by experience.

Defendants' Brief at 10. Defendants did not cite any evidence for this characterization of the level of ordinary skill in the art. Their failure to come forward with evidence on this point weighs in favor of finding that the push rod claimed in the '315 patent is non-obvious. *Lifting Technologies, supra*.

Robert Fox, Trend's president, chief technical officer and lead engineer for push rods, testified at deposition that he considers himself a person of ordinary skill in the art of push rod technology. Unlike Defendants' hypothetical artisan, Mr. Fox has a high school diploma and does not have any engineering certification. However, from approximately 1984 through 1988, he worked for Diamond Racing Products, where he sold engine components, including push rods. Mr. Fox had worked with race cars as a hobby since before he turned sixteen years old. He considers himself a person experienced in the field of mechanics in push rods.

Plaintiff's expert, Dr. David Bourell, is a professor of engineering at the University of Texas. Dr. Bourell received a B.S. in Mechanical Engineering, an M.S. in Materials Science and Engineering, and a Ph.D. in Materials Science and Engineering. Dr. Bourell testified by declaration as follows:

I believe that one needs to have at least an engineering background, such [as] a Mechanical Engineering degree, or the equivalent in practical experience in order to be qualified to speak as to the meaning of the '315 patent as a whole.

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Bourell Dec. at 2.

At the *Markman* hearing on March 23, 2004, Defendants' expert, Dr. Swanger, testified that the level of skill in the art "for one that practiced the art shown in the ['315 patent]" is the "art of design and manufacture of push rods for automotive engines." *Markman* Hearing, March 23, 2004 at 28. Dr. Swanger's testimony on this point is confusing, as it defines the relevant field of expertise, ie, push rods, but does not purport to define the level of ordinary skill within the field.

Dr. Swanger earned a B.S. in metallurgical engineering, and M.S. in materials science and engineering, a Ph.D. in materials science and engineering, and post-doctoral education in metallurgical engineering. Dr. Swanger also has practical experience in the field of automotive engines. He previously worked for General Motors in its metallurgical department, and for Clevite Corporation in research and design for the development of engine components. Dr. Swanger considers himself skilled in the art of design and manufacture of push rods for automotive engines.

The Court finds that the level of skill of the parties' experts, Dr. Bourell and Dr. Swanger, may in fact surpass the level of skill of those of ordinary skill in the art. Therefore, their conclusions as to the elements of the obviousness inquiry are not necessarily the standard to be followed. *Creative Pioneer Products Corp. v. K Mart Corp.*, 5 U.S.P.Q.2d 1841, 1844; 1986 WL84403 (S.D. Tex. 1986).

More importantly, neither Dr. Bourell nor Dr. Swanger testified specifically

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as to the *ordinary* level of skill in the art of manufacturing and designing push rods. While Dr. Bourell testified to the level of skill necessary “to be qualified to speak as to the meaning of the ‘315 patent as a whole,” this testimony does not properly characterize the “ordinary person” created by 35 U.S.C. § 103.

Based on the evidence in the record, the Court finds that there are outstanding fact questions as to the level of ordinary skill in the art of push rod manufacturing and design. Therefore, the parties will have to present additional evidence at trial on this evidentiary factor.

iv. Objective or Secondary Considerations

“Secondary considerations are useful to guard against slipping into hindsight.” *Badalamenti*, 680 F.Supp. at 264 (citing *Graham*, 383 U.S. at 36). “There must be a nexus between the merits of the claimed invention and the evidence of secondary considerations if the evidence is to be given substantial weight indicating nonobviousness.” *Id.* (internal citations omitted). Relevant objective or secondary considerations include inquiring into whether there was a long-felt but unresolved need for the claimed invention, the failure of others, or whether the invention has enjoyed commercial success. *Id.*

In this case, the parties have not put forth any evidence of secondary factors which would affect the Court’s obviousness analysis. Therefore, secondary factors do not carry any weight in the obviousness analysis at this point in the litigation.

b. Suggestion or Motivation to Combine Teachings from Prior Art

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The party seeking patent invalidity based on obviousness must also show some motivation or suggestion to combine the prior art teachings. *See In re Rouffet*, 149 F.3d 1350, 1355 (Fed.Cir.1998).

The reason, suggestion, or motivation to combine [prior art references] may be found explicitly or implicitly: (1) in the prior art references themselves; (2) in the knowledge of those of ordinary skill in the art that certain references, or disclosures in those references, are of special interest or importance in the field; or (3) from the nature of the problem to be solved, ‘leading inventors to look to references relating to possible solutions to that problem.’

Ruiz v. A.B. Chance Co., 234 F.3d 654, 665 (Fed. Cir. 2000) (quoting *Pro-Mold*, 75 F.3d at 1572); *see also In re Rouffet*, 149 F.3d 1350, 1355 (Fed.Cir.1998).

The Federal Circuit “[has] consistently held that a person of ordinary skill in the art must not only have had some motivation to combine the prior art teachings, but some motivation to combine the prior art teachings in the particular manner claimed.” *Teleflex*, 110 Fed. Appx. at 286 (citing *In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000) (“Particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed.”)). In other words,

[Defendants] must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

In re Rouffet, *supra* at 1357.

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The suggestion or motivation element is critical because

combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability—the essence of hindsight.

In re Dembiczak, 175 F.3d 994, 999 (Fed. Cir. 1999), abrogated on other grounds in *In re Gartside*, 203 F.3d 1305 (Fed. Cir. 2000).

In light of the Federal Circuit's decision, Defendants now argue that the '315 patent is invalid for obviousness because it would have been obvious to a person of ordinary skill in the art to combine the teachings of the Japanese patents with the teachings of the prior art references to produce a push-rod identical to the one described in the '315 patent.

Specifically, Defendants argue that the *only* distinction between the Japanese push rods and the '315 push rod is that the '315 push rod is wider at its mid portion and that this innovation was anticipated by the prior art discussed above.

According to Defendants, the prior art references enabled the use of wider mid portions to solve the same problem that the '315 patent purports to solve, namely, a lack of strength and a need for better bending resistance than other push rods.

Defendants argue that Timoshenko bridges the design gap between Plaintiff's '315 patent and the JP '635 and '808 patent by showing the use of a wider mid-portion to strengthen columnar structures.

The Court finds that underlying questions of fact preclude summary

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judgment on the question of motivation to combine. First, there is not enough evidence in the record from which to conclude that an ordinary artisan would have sought to solve the problems addressed by the '315 patent by consulting the 1936 Timoshenko textbook.

This factual weakness in Defendants' case for obviousness is worsened by the fact that the Court is not currently able to characterize the hypothetical ordinary artisan beyond factual dispute. In other words, if the ordinary artisan were a certified engineer with a Ph.D. in materials science, then it would be more likely that the ordinary artisan would refer to Timoshenko in order to bridge the gap between prior push rod art and the '315 patent. If the ordinary artisan were more like Mr. Fox from Trend, a person without college training but with a wealth of practical engineering experience in the field of high-performance engines, then it would be less likely that the ordinary artisan would attempt to solve the problems presented by referring to Timoshenko.

In addition, the Court believes that a finding of obviousness at this point in the litigation would be an exercise in improper hindsight recreation. Defendants argue that the '315 patent is obvious because at deposition Dr. Bourell traced every element of the '315 patent to the teachings of the prior art by engaging in a side-by-side comparison of the '315 patent to the prior art.

In *Orthopedic Equip. Co. v. United States*, 702 F.2d 1005, 1012 (Fed. Cir. 1983), the Court held that "[i]t is wrong to use the patent in suit as a guide through

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the maze of prior art references, combining the right references in the right way so as to achieve [a desired result].” 702 F.2d at 1012. In other words,

[i]t is impermissible to use the claimed invention as an instruction manual or ‘template’ to piece together the teaching of prior art so that the claimed invention is rendered obvious and unpatentable.

C.J.S. Patents § 69 (citing *In Re Fritch*, 972 F.2d 1260 (Fed. Cir. 1992)).

The case law of the Federal Circuit

makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references.

Dembiczak, 175 F.3d at 999.

In this case, Dr. Bourell testified as to the similarities between the ‘315 patent and the prior art while using the ‘315 patent as a baseline, or template reference against the prior art references. While this technique is persuasive, it amounts to improper hindsight recreation under the law of the Federal Circuit.

The current record in this case does not establish, by clear and convincing evidence, that the ‘315 patent is invalid as obvious. Many of the prior art references differ from the ‘315 patent either because they teach multiple piece or solid push rod designs. The Timoshenko textbook does not appear to bridge the gaps between the ‘315 push rod and the prior art references. Most importantly, there are outstanding factual questions as to the most important element of the

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obviousness analysis, that is, the level of skill of the the ordinary artisan.

Therefore, Defendants' motion for summary judgment of obviousness is DENIED.

2. Indefiniteness

A patent claim is sufficiently definite if it reasonably notifies one of ordinary skill in the art of the scope of the invention. *Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1378 (Fed. Cir. 2000). To prevail, Defendants must show indefiniteness by clear and convincing evidence. *Monarch Knitting Mach. v. Sulzer Morat GMBH*, 139 F.3d 877, 881 (Fed.Cir.1998).

In its previous summary judgment order, the Court determined that the '315 patent was invalid for indefiniteness because the phrase "substantially constant wall thickness" was unclear and not reasonably ascertainable to a person skilled in the art of the '315 patent. The Court of Appeals for the Federal Circuit reversed and remanded to this Court for a determination of whether or not the '315 patent is indefinite based on the intrinsic evidence and, if necessary, extrinsic evidence:

While reference to intrinsic evidence is primary in interpreting claims, the criterion is the meaning of the words as they would be understood by persons in the field of the invention. Patent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners, lest every patent be required to be written as a comprehensive tutorial and treatise for the generalist, instead of a concise statement for persons in the field. Thus resolution of any ambiguity arising from the claims and specification may be aided by extrinsic evidence of usage and meaning of a term in the context of

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the invention. The question is not whether the word “substantially” has a fixed meaning as applied to “constant wall thickness,” but how the phrase would be understood by persons experienced in this field of mechanics, upon reading the patent documents. It may of course occur that persons experienced in a technologic field will have divergent opinions as to the meaning of a term, particularly as narrow distinctions are drawn by the parties or warranted by the technology. Patent disputes often raise close questions requiring refinement of technical definitions in light of particular facts. The judge will then be obliged to decide between contending positions; a role familiar to judges. But the fact that the parties disagree about the claim scope does not of itself render the claim invalid.

311 F.3d at 1119-20. In other words, the question is whether or not the use of the phrase “substantially constant wall thickness” is consistent with the nature of push rod technology, particularly the push rod described in the ‘315 patent.

As discussed above in the context of claim construction, the parties have submitted evidence as to the meaning of the phrase “substantially constant wall thickness” in the proper context, that is, the art of push rod technology. Based on the evidence submitted, including the testimony of Drs. Burrell and Swanger, the Court concludes that the ‘315 patent is not indefinite as a matter of law.

In their renewed motion for summary judgment, Defendants make two arguments as to indefiniteness. First, Defendants argue that the extrinsic evidence fails to disclose “at what percentage of variation ‘substantially constant’ is no longer ‘substantially constant.’” Defendants’ Reply Brief at 5. Without such a threshold, Defendants argue, reasonable persons will lack notice of the patent’s

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true scope.

Defendants rely on the deposition testimony of Plaintiff's expert, Dr. Bourell, who testified that he is "not sure if there is language [in the '315 patent] that would specifically point us toward what [the definition of 'to a large degree constant'] would be." Bourell Dep. at 109. Dr. Bourell also testified that he could not cite "any push rod art that teaches us to set an upper limit of percentages in making wall thickness constant to a considerable degree[.]" *Id.*

In *Andrew Corp. v. Gabriel Elecs, Inc.*, 847 F.2d 819 (Fed. Cir. 1988), the Federal Circuit stated that "a claim is not fatally indefinite for failing specifically to delineate the point at which the change in physical phenomenon occurs." *Andrews*, 847 F.2d at 822. Similarly, in *Playtex Products, Incorporated v. Procter & Gamble Company*, ---F.3d ---, 2005 WL 517914 (Fed. Cir. Mar. 7, 2005), the Federal Circuit stated that patent language need not describe the claimed invention "at the level of manufacturing specification." *Playtex*, 2005 WL 517914 at *6.

In *Playtex, supra*, the Federal Circuit held that a patent which claimed in part a portion of a tampon applicator having "two diametrically opposed, substantially flattened surfaces" was not indefinite and that the district court improperly defined "substantially flattened" to include a numerical value:

"The term 'substantial' is a meaningful modifier implying 'approximate,' rather than 'perfect.'" *Liquid Dynamics [Corp. V. Vaughan Co., Inc.]*, 257 F.3d 1361, 1368 (Fed. Cir. 2004)]. But the definition of "substantially flattened surfaces" adopted by the district court introduces a numerical tolerance to the flatness of the gripping

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area surfaces of the claimed applicator. That reading contradicts the recent precedent of this court, interpreting such terms of degree. In *Cordis Corp. v. Medtronic AVE, Inc.*, 339 F.3d 1352, 1361 (Fed. Cir. 2003), we refused to impose a precise numeric constraint on the term “substantially uniform thickness,” noting that the proper interpretation of this term was “of largely or approximately uniform thickness” unless something in the prosecution history imposed the “clear and unmistakable disclaimer” needed for narrowing beyond this plain-language interpretation. Moreover, in *Anchor Wall Sys. v. Rockwood Retaining Walls, Inc.*, 340 F.3d 1298 (Fed. Cir. 2003), we held that “the phrase ‘generally parallel’ envisions some amount of deviation from exactly parallel,” and that “words of approximation, such as ‘generally’ and ‘substantially,’ are descriptive terms ‘commonly used in patent claims ‘to avoid a strict numerical boundary to the specified parameter.’” *Id.* at 1311.

Playtex, supra at 11.

Defendants do not cite any case law in support of their argument that the ‘315 patent is indefinite for lack of a clear threshold between substantially constant and non-substantially constant wall thickness variations. More importantly, the testimony of Dr. Bourell cited by Defendants does not go so far as to conclude that a person of ordinary skill in the art would fail to understand the scope of the ‘315 patent after reading its terms or that a numerical upper limit would be necessary for providing such an understanding of the patent’s scope. Therefore, the Court holds that the phrase “substantially constant wall thickness,” in the context of the art of push rod technology, adequately describes the amount of wall thickness variation allowable under the ‘315 patent such that the patent is not indefinite.

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Defendants' second argument as to indefiniteness is that there are multiple methodologies for measuring variation in wall thickness for push rods, each of which is equally valid, and each of which would yield different results. Thus, Defendants argue that persons of ordinary skill in the art would not know the scope of the '315 patent because they would not know which of the various measurement methodologies to employ in order to determine whether their push rods infringe the "substantially constant wall thickness" limitation.

Defendant's expert, Dr. Lee Swanger, testified at the *Markman* hearing on March 23, 2004 that there are at least five (and probably more) acceptable methods for computing variation in wall thickness of a push rod. *Markman* Hearing, 3/23/04 at 29-35. Among all of the methods discussed by Dr. Swanger, no particular method stood out as *the method* suggested by the prosecution history or patent language at issue. *Markman* Hearing, 3/23/04 at 34.

Plaintiff's expert, Dr. Bourell, testified that he agreed with Dr. Swanger, "for the most part," as to the acceptability of various methodologies for testing variation in wall thickness. *Id.* at 59-60. Dr. Bourell further testified that the claims in the '315 patent do not address measurement methodology and that the percentage variation in wall thickness would vary according to the methodology used. *Id.* at 62.

Neither Dr. Swanger nor Dr. Bourell testified that the methods for wall thickness were so obscure as to defy understanding by persons of ordinary skill in

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the art. More importantly, each expert, believing himself to be a person skilled in the art, chose one particular method for determining wall thickness variation. As discussed above, Dr. Bourell endorsed the “nominal thickness method while Dr. Swanger endorsed the “thickest-to-thinnest method.”

Based on the foregoing, the Court finds that the failure of the ‘315 patent to specify the particular measurement methodology to be used for determining wall thickness variation does not render the ‘315 patent invalid for indefiniteness. At the very least, the conflict in the extrinsic evidence, that is, between the testimony of the parties’ experts, creates a genuine issue of material fact as to whether or not a person of ordinary skill in the art would understand the scope of the ‘315 patent. Defendants have failed to demonstrate that the ‘315 patent is indefinite by clear and convincing evidence. Accordingly, Defendants’ motion for summary judgment of invalidity due to indefiniteness is DENIED.

C. Non-Infringement

Defendants argue that their one-piece push rods do not infringe the ‘315 patent as a matter of law because their rods either (i) do not taper in the manner required by the ‘315 patent; or (ii) do not have walls of substantially constant thickness as required by the ‘315 patent.

As to tapering, the Federal Circuit has determined that certain push rods do not infringe the ‘315 patent as a matter of law:

Although the defendants argue that the ball shape at the end of the

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Japanese rods is of narrower diameter than the rest of the rod and thus that the Japanese end portion is narrower than the middle portion, **the invention as described and claimed in the '315 patent does not encompass a tube of uniform diameter along its length, whatever the diameter at the rounded tip.**

Verve, 311 F.3d at 1121 (emphasis added).

In order to reflect the Federal Circuit's claim construction, this Court's March 26, 2004 order included the following claim limitation:

A rod does *not* infringe Claim 1 although it technically meets the definition if it has a constant diameter in the space between the rod's two end portions.

March 26, 2004 Order.

Plaintiff's expert, Dr. Bourell, testified at his deposition that certain of Defendants' push rods, namely those rods which taper from a 3/8" diameter middle portion to a 5/16" diameter end portion, maintain a constant diameter along their length, or middle portion. Therefore, according to the Federal Circuit's decision in this case, any of Defendants' rods which maintain a constant diameter along their length, or middle portion, do not infringe the '315 patent as a matter of law. Such rods include, but may not necessarily be limited to, rods which taper from 3/8" to 5/16."

The chart attached as Appendix A was presented by Plaintiff at the continued motion hearing on March 8, 2005, and shows the types of push rods currently in dispute in this case. *See Appendix A, Push Rod Chart.*

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Plaintiff argues that the Federal Circuit's decision does not mandate a finding of non-infringement as to rods resembling "D" in the above exhibit because the Federal Circuit's opinion would exclude only rods that are of constant diameter across their "entire length." Oral Argument Transcript, March 8, 2005 at 35.

Two aspects of the Federal Circuit's opinion require that Plaintiff's argument be rejected. First, the plain language of the Federal Circuit's opinion does not include the phrase "entire length." Second, the Japanese push rods at issue on appeal in the Federal Circuit were not of a constant diameter across their "entire length," yet the Federal Circuit held that the constant diameter across the "length" (presumably the middle portions) of the JP '635 and JP '808 rods distinguished them from the invention claimed by Plaintiff's '315 patent.

Based on the ruling of the Federal Circuit, the Court holds that only rods generally resembling rods "A" and "B" on the foregoing chart could arguably infringe the '315 patent. The remaining rod configurations, "C," "D," and "E" do not infringe the '315 patent as a matter of law because, like the JP '635 and JP '808 push rods considered by the Federal Circuit, rods such as "C," "D," and "E" maintain a constant diameter along their length, or middle portion.

As to push rods generally resembling "A" and "B" in Appendix A, as well as to any rods which do not maintain a constant diameter across their length, or middle portion, the Court finds that summary judgment is improper due to its

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revision of the applicable claim construction as well as outstanding factual questions concerning the interpretation of measurement data.

V. CONCLUSION

Based on the foregoing,

IT IS HEREBY ORDERED that the Court's claim construction is modified to define the term "substantially constant wall thickness" as "wall thickness that is to a large or considerable degree constant."

IT IS FURTHER ORDERED that Defendants' motions for summary judgment of invalidity are DENIED.

IT IS FURTHER ORDERED that Defendants' motions for summary judgment of non-infringement are GRANTED only as to push rods which maintain a uniform diameter along their middle portion.

IT IS SO ORDERED.

s/Arthur J. Tarnow
Arthur J. Tarnow
United States District Judge

Dated: May 11, 2005

I hereby certify that a copy of the foregoing document was served upon counsel of record on May 11, 2005, by electronic and/or ordinary mail.

s/Kendra Byrd
Case Manager

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